

WHAT IS CLAIMED IS:

1. An actuated film display device comprising:

a first fixed electrode;

a first movable film electrode, which is placed to face the first fixed electrode to form a first optical path on an opposing side to the first fixed electrode, and which has a fixed end and a movable end, the movable end being displaced toward the first fixed electrode by application of a voltage not less than a first critical voltage between the first fixed electrode and the first movable film electrode, thereby shutting off the first optical path;

a second fixed electrode placed at a predetermined distance from the first fixed electrode;

a second movable film electrode, which is placed to face the second fixed electrode to form a second optical path on an opposing side to the second fixed electrode, which has a fixed end and a movable end, the movable end being displaced toward the second fixed electrode by application of a voltage not less than a second critical voltage between the second fixed electrode and the second movable film electrode, thereby shutting off the second optical path, the second critical voltage being different from the first critical voltage, and the first movable film electrode and the second movable film electrode being connected to a first signal line; and

a plurality of pixels, each of the plurality of pixels including a pair of the first fixed electrode and the first movable film electrode and a pair of the second fixed electrode and the second movable film electrode,

wherein the plurality of pixels provide gray scale display in accordance with a potential applied between the first fixed electrode and the first movable film electrode

and between the second fixed electrode and the second movable film electrode at the same time.

2. The actuated film display device according to claim 1, wherein a distance between the fixed end and the movable end of the first movable film electrode differs from a distance between the fixed end and the movable end of the second movable film electrode.

3. The actuated film display device according to claim 1, wherein a thickness of the first movable film electrode differs from a thickness of the second movable film electrode.

4. The actuated film display device according to claim 1, wherein a distance between the first fixed electrode and the fixed end of the first movable film electrode differs from a distance between the second fixed electrode and the fixed end of the second movable film electrode.

5. The actuated film display device according to claim 1, further comprising a plurality of pixels, each of the plurality of pixels including a pair of the first fixed electrode and the first movable film electrode and a pair of the second fixed electrode and the second movable film electrode.

6. The actuated film display device according to claim 1, wherein each of the first and the second fixed electrode comprises a light guiding portion which is formed of a transparent material and has a curved surface which faces a corresponding one of the first and the second movable film electrode, and an electrode formed of a transparent conductive layer and formed on the curved surface.

7. The actuated film display device according to claim 6, further comprising an insulating layer covering the conductive layer.

8. The actuated film display device according to claim 1, wherein the first and the second fixed electrode is a plate-form electrode which faces a corresponding one of the first and the second movable film electrode so as to form a light guiding portion therebetween.

9. The actuated film display device according to claim 8, further comprising an insulating layer covering at least a tip portion of each of the first and the second fixed electrode.

10. The actuated film display device according to claim 1, further comprising a light source arranged at a side of the fixed ends of the movable film electrodes.

11. The actuated film display device according to claim 1, wherein the first fixed electrode and the second fixed electrode are connected to another single signal line.

12. An actuated film display device comprising:

a plurality of optical shutter sets arranged in rows and columns, each of the optical shutter sets comprising at least two optical shutter units different in applied voltage/displacement characteristics, said at least two optical shutter units including a pair of a first fixed electrode and a first movable film electrode and a pair of a second fixed electrode and a second movable film electrode, the first and second movable film electrodes being of a light-shield cantilever-type,

the first movable film electrode being placed to face the first fixed electrode to form a first optical path on an opposing side to the first fixed electrode, and having a fixed end and a movable end, the movable end being displaced toward the first fixed electrode by application of a voltage not less than a first critical voltage between the

first fixed electrode and the first movable film electrode, thereby shutting off the first optical path,

the second movable film electrode being placed to face the second fixed electrode to form a second optical path on an opposing side to the second fixed electrode, and having a fixed end and a movable end, the movable end being displaced toward the second fixed electrode by application of a voltage not less than a second critical voltage between the second fixed electrode and the second movable film electrode, thereby shutting off the second optical path, the second critical voltage being different from the first critical voltage, and the first movable film electrode and the second movable film electrode being connected to a single signal line;

a first driving circuit for supplying a driving signal to the optical shutter sets arranged in each of the rows; and

a second driving circuit for supplying a driving signal to the optical shutter sets arranged in each of the columns,

the first driving circuit supplying a first potential to the fixed electrode of the optical shutter units in each of the rows, and the second driving circuit supplying a second potential to the single signal line, to which the movable film electrode of the optical shutter units is connected, in each of the columns,

wherein the optical shutter sets provide gray scale display in accordance with the first and second potentials applied to the shutter sets.

13. The actuated film display device according to claim 12, wherein, said at least two shutter units are different in distance between a fixed end and a movable end of the movable film electrode.

14. The actuated film display device according to claim 12, wherein, said at least two shutter units are different in thickness of the movable film electrode.

15. The actuated film display device according to claim 12, wherein, said at least two shutter units are different in distance between the fixed electrode and a fixed end of the movable film electrode.

16. The actuated film display device according to claim 12, wherein the fixed electrode has a light guiding portion formed of a transparent material and having a curved surface which faces the movable film electrode and an electrode formed of a transparent conductive layer formed on the curved surface.

17. The actuated film display device according to claim 12, wherein the fixed electrode is a plate-form electrode and faces the movable film electrode so as to form a light guiding portion between the movable film electrode and the fixed electrode.